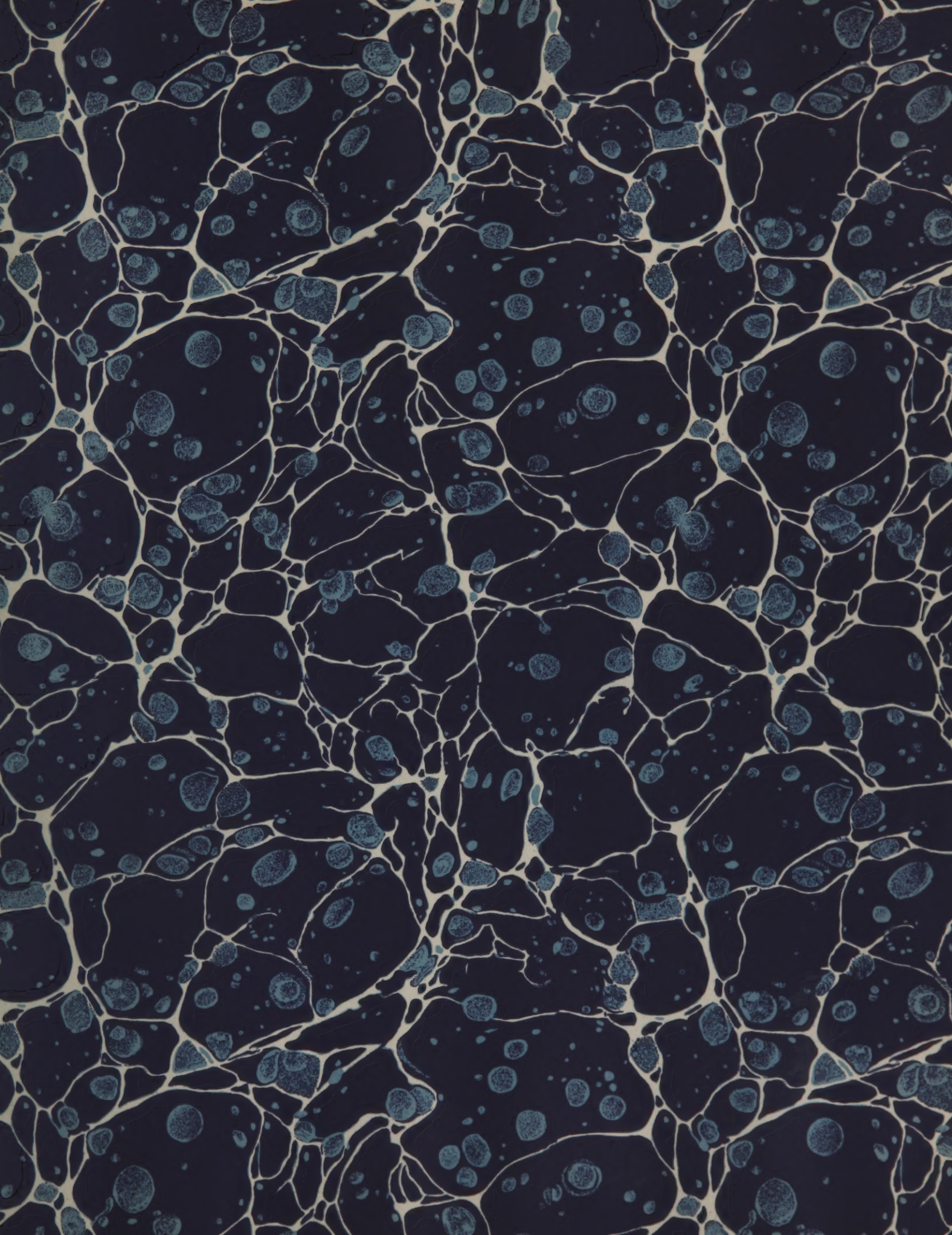

A SYNOPTICAL TABLE

OF

THORACIC PERCUSSION AND AUSCULTATION.

ARRANGED FROM THE WORKS OF LAENNEC, HOPE, LOUIS, PIORRY, WILLIAMS, AND OTHERS, AND THE LECTURES OF BARTH, ROGER, AND LANDOUZY.

BY

C. L. MITCHELL, M. D.

NEW-YORK, 1839

PERCUSSION.

Discovered by Avenbrugger in 1761, but fell into neglect until introduced by Corvisart in 1808.

It is *immediate* or *mediate*, the latter being performed through the medium of a *pleximeter*. This may be of ivory, cauthchouc, a finger, &c.

PERCUSSION OF THE CHEST IN THE NORMAL STATE.

Anterior regions.	Right Side.	Clear sound from above the clavicle to two fingers' breadth below the nipple.
	Sternum.	Hepatic dulness from this limit to the edge of the false ribs.
	Left Side.	Clear sound from above the clavicle to the nipple. Cardiac dulness from the nipple downward in an extent of two inches. Clear sound of stomach below this, and sometimes splenic dulness.
Posterior regions.	Superior Half.	Muscular dulness on both sides, more marked in the muscles are thicker.
	Inferior Half.	Hepatic dulness at the inferior part of the right side.
Lateral regions.	Right Side.	Clear sound from the axilla to the sixth rib.
	Left Side.	Hepatic dulness from this limit to the border of the false ribs.
		Clear sound from the axilla to the eighth rib.
		Clear sound of stomach, and sometimes splenic dulness below this limit.

PERCUSSION OF THE CHEST IN THE ABNORMAL STATE.

MODIFICATIONS.	NAMES.	PATHOLOGICAL SIGNIFICATIONS. (The Diseases are arranged in the order of their frequency.)	
Increased sound.	Tympanitis	In the two superior thirds of the thorax, and on one side only.	Pneumo-thorax. Large excavations from abscess.
		On one or both sides and chiefly at the free edges of the lungs.	Pulmonary emphysema. Pneumo pericardium.
Diminished sound.	Dulness, complete or incomplete.	At the summit only.	Tubercles. Pneumonitis. Pleuritic adhesions. Pulmonary apoplexy. Aneurisms and accidental productions.
		At the base only.	Pneumonitis. Pleuritic effusions. Pleuritic adhesions. Tubercles. Pulmonary apoplexy. Œdema.
		In the middle third only.	Pneumonitis. Pleuritic adhesions. Pulmonary apoplexy. Accidental productions.
		In the whole extent.	Pleuritic effusions. Pleuritic adhesions. Pneumonitis. Tubercles. Pulmonary Œdema. Tubercles.
		At the summit of both lungs.	Pneumonitis. Accidental productions.
		At the base of both lungs.	Pleuritis. Double pneumonitis. Œdema.
		At the summit of one or both lungs.	Pulmonary excavations. Circumscribed pneumo-thorax. Dilated bronchi.
Modified sound.	Sound of cracked pot.		

AUSCULTATION

Is *immediate* or *mediate*, the latter being performed through the medium of the Stethoscope.

AUSCULTATION OF RESPIRATION.

OF NORMAL RESPIRATION.

Inspiration louder and longer than expiration. The latter in many subjects is inaudible.

Modifications according to the different points of the chest.	Rougher at the root of the lungs. A little *bronchial*.
Modifications according to the age.	In infants, louder. In adults, varies with individuals. In old persons, more feeble.

OF ABNORMAL RESPIRATION.

NAMES.		CHARACTERS.	CAUSES.	PATHOLOGICAL SIGNIFICATIONS.
Vesicular respiratio	Modifications in intensity.	Loud Respiration or Puerile.	Supplementary action of healthy vesicles.*	Indeterminate disease in any part more or less distant. Spasmodic asthma.†
		Feebleness.	More or less complete impermeability of pulmonary tissue. Slight separation of the lungs from the thoracic parietes. Obstruction to the free passage of air to the lungs.	Crude tubercles. Emphysema. Moderate pleuritic effusions. Pleuritic adhesions. Compression of the lungs, or bronchi from accidental productions. Laryngitis, Trachitis, foreign bodies in the larynx or trachea.
		Silence.	Complete impermeability of the pulmonary tissue. Separation of lungs from the parietes of the thorax. Obstruction to the free passage of air to the lungs.	Pleuritic effusion. Pneumo-thorax. Agglomerated crude tubercles. Temporary obstruction of bronchi by mucus or pus. Considerable emphysema. Accidental productions. Pulmonary indurations. Laryngitis, Trachitis, foreign bodies in the larynx or trachea.
	Modifications in texture.	Harsh—dry.		Pulmonary emphysema.
		Prolonged Expiration.	Obstruction to the free passage of air from the vesicles.	Crude tubercles. Emphysema.
Bronchial respiration.		Harsh and loud—short inspiration without expansion of the vesicles.	Pulmonary induration, generally. Dilatation of bronchi, rarely.	Hepatization. Crude tubercles. Pleuritic effusion. Dilatation of bronchi.
Cavernous respiration.		Dry and sonorous. Expiration long and slow.	Pulmonary excavation generally. Bronchial dilatation by exception.	Pulmonary cavity from tubercles. " " " pneumonitis. " " " gangrene. Dilated bronchi.
Amphoric respiration.		Like the sound produced by blowing into the mouth of a decanter. Sometimes in the place of, or alternating with metallic tinkling.	Passage of air through a small orifice into a large cavity.	Pneumo-thorax, with perforation of the lung. Large pulmonary cavity, almost always tuberculous. Vast dilatation of bronchi.

* A portion of the lung becoming impermeable to air, the remainder takes on an increased action in order to supply the deficiency.
† Bronchial respiration, when not well characterized, is difficult to be distinguished from cavernous, but the latter almost always has its seat under the clavicle, and is generally accompanied with the *gurgling* rattle and cavernous cough.

AUSCULTATION.

OF THE BRONCHI.

NAMES.	CHARACTERS.	CAUSES.	PATHOLOGICAL SIGNIFICATIONS.
	I. Tracheal Rhonchus.		
Tracheal.	Very large bubbles. Often accompanied with sonorous rattle. Sometimes heard at a distance. Sometimes sensible to the hand.	Passage of air through mucus, in the trachea.	Accumulation of mucus in the trachea in arteriolo mortis. Suffocating catarrh.
	II. Bronchial Rhonchi.		
Dry { **Sibilous.**	Acute sound and all its modifications. { Whistling. Hissing. Clicking. Cooing. Snoring. Bass chord.	Passage of air through bronchial tubes, the diameter of which is diminished, either permanently or transiently.	Bronchitis, acute or chronic. Pulmonary emphysema. Compression of bronchial tubes.
Sonorous.	Grave sounds. Generally heard throughout the whole chest.	Vibrations of mucus in the bronchi.	
Humid (Mucous.*	Bubbles, *large* or *small*. Of middling size oftenest. Of unequal volume. Of unequal number. Heard in inspiration, and in expiration.	Passage of air through the mucus which fills the larger bronchi.	Second stage of acute bronchitis, or *Chronic bronchitis*. Softening of tubercles. Hemoptysis.
	III. Vesicular Rhonchi.		
Crepitous.†	Bubbles small, equal in volume, very numerous, circumscribed. Heard in inspiration only. Heard oftenest at the base of the lungs. Almost always on one side. Much more behind than before.	Passage of air through the mucus which fills the pulmonary vesicles, and the minute ramifications of the bronchi.	Pneumonitis in a state of engorgement, at the onset or towards resolution. Pulmonary apoplexy. Interlobular emphysema. Sometimes in healthy persons at the instant of a first forcible inspiration.
Subcrepitous.	Bubbles larger and less regular. Heard in inspiration and expiration.	Passage of the air through the mucus which fills the pulmonary vesicles and lesser bronchi.	Pneumonitis in resolution. Pulmonary apoplexy with hæmoptysis.
	IV. Cavernous Rhonchus.		
Gurgling.‡	Bubbles very large. Generally limited to the summit of the lungs. Almost always accompanied with cavernous respiration and cavernous cough.	Passage of air through pulmonary cavities containing a liquid.	Pulmonary excavations from softened tubercles generally. Abscess. Gangrene. Dilated bronchi.

* The mucous rattle is attended with clear sound on percussion.
† Percussion yields a dull sound.
‡ Heard at base of the lungs in Bronchitis, but at the summit in Phthisis.

AUSCULTATION OF THE VOICE.

OF THE NORMAL RESONANCE OF THE VOICE.

There is no type of the natural resonance of the voice: it varying in individuals, must be judged of by comparison, being generally strong if the tone of voice is grave, and feeble if it is acute.

It is strongest on a level with the great bronchial tubes at the root of the lungs, and greater in the right side than in the left.

Old men, and more especially old women, have a voice naturally ægophonous.

OF THE ABNORMAL RESONANCE OF THE VOICE.

NAMES.	CHARACTERS.	CAUSES.	PATHOLOGICAL SIGNIFICATIONS.
Bronchophony.	Resonance stronger than natural and generally diffused.	Vibrations of the voice in the great bronchial tubes, or in dilated bronchi.	Pulmonary induration generally. from Hepatization, " Tubercles, " Compression by effusion. Bronchial dilatation rarely.
Pectoriloquy.	Greatest possible resonance of the voice. Resonance circumscribed chiefly at the summit of the lungs, the voice traversing the stethoscope to the ear. Is EVIDENT OR DUBITFUL, the latter not distinguishable from bronchophony.	Resounding of the voice in a large cavity. Conditions necessary to *evident* pectoriloquy are, a superficial situation of the cavity, its capacity, dryness, and free communication with the bronchial tubes.	Pulmonary excavation. from softening of tubercles; abscess; " gangrene. Dilatation of the bronchi.
Ægophony.	Tremulousness of the voice like that of a goat. Voice of a man speaking with a counter in his mouth—voice of *Punch*. Heard mostly near the inferior angle of the scapula, during the first and last few days of pleurisy.	Communication of the vibration of the voice in the bronchi through a liquid. Conditions necessary to its existence are a thin bed of liquid and elasticity of lung.	Effusion of fluid in the pleura. Sero-sanguineous } Pleurisy. Sero-fibrous } Sero-purulent } Sero-albuminous } Pleurisy. Serous } Hemorragic Sanguineous } pleurisy.

* Much absolute importance cannot be attached to the signs furnished by the voice. Bronchophony sometimes several diseases. Evident pectoriloquy and especially ægophony are not met with in one case in ten of the diseases which they indicate, still they are of pe in confirming the diagnosis drawn from the other physical signs.

OF METALLIC TINKLING AND PLEURITIC RUBBING.

(These sounds cannot be classed in either of the preceding divisions.)

NAMES.	CHARACTERS.	CAUSES.	PATHOLOGICAL SIGNIFICATIONS.
Metallic-tinkling.	Resembles the sound produced by striking a metallic or porcelain cup with the head of a pin. It can be exactly imitated by dropping water into a decanter three-fourths empty.	Vibration of air produced by the respiration, cough or voice, at the surface of a liquid in a large cavity in the chest; or by the falling of a drop of serum, or the bursting of air bubbles on the surface of the liquid so contained.	Pneumo-thorax with hydro-thorax. " " empyema. Almost always with a fistulous opening between the bronchiæ and pleural cavity. Very rare without perforation. Large pulmonary cavity.
Pleuritic-rubbing.	A variable rubbing which generally consists in a dry crocking compared to the folding of parchment. Sometimes like the bubbles of mucous rattle. Sometimes sensible to the hand.	Frictions of the pleuræ covered with false membranes, in the movements of respiration. Reticulated disposition of the false membrane. (Louis.) Irregular surface of pleura.	Pleurisy with effusion. Resolution of pleurisy with effusion: the absorption of the liquid allows the approach of the membranes. Interlobular emphysema.†

AUSCULTATION OF THE HEART.

The left edge of the sternum divides the præcordia into two regions.

REGIONS.	LIMITS.		CONTENTS.
Right.	Inferior third of the sternum.	One third of the heart.	Right auricle and superior portion
Left.	From the inferior edge of the cartilage of the third rib to the superior edge of the seventh, extending one inch and a half to the left of the sternum.	Two thirds of the heart.	The left cavities and inferior portion

AUSCULTATION.

PHENOMENA OF THE HEART'S ACTION.

Rythm.	Systole.	Contraction of the ventricle. Isochronous with shock against the walls of the chest, extension of the auriculo-ventricular valves, depression of the sigmoid valves, pulsation of the arteries, and the first sound of the heart. Duration, half of the time of one beat.
	Diastole.	Dilatation of the ventricles. Isochronous with extension of the sigmoid valves, depression of the auriculo-ventricular valves, influx of blood from the auricles, and the second sound of the heart. Duration, quarter of the time of one beat.
	Repose.	Relaxation and repletion of the ventricles. Silence. Duration, quarter of the time of one beat.

	MODIFICATIONS.	CAUSES INDEPENDENT OF THE HEART.	CAUSES DEPENDING UPON THE HEART.
Extent of sounds.	Diminished.	In fat subjects may be reduced to a square inch of surface.	
	Increased.	In infants, emaciated subjects, and those with narrow and deformed chests, and in induration of the pulmonary tissue, may extend to sternal and left anterior regions: rarely throughout the whole chest.	Attenuation of the walls of the heart.
Impulse.	Diminished.	Intense dyspnœa from pulmonary affections. Great debility, from loss of blood, diarrhœa, typhus fever, &c.	Dilatation with attenuation of the walls of the heart.
	Increased.	Active exercise, nervous affections, fever, loss of blood, &c.	Hypertrophy of the heart.
Intensity of sound.	Diminished.	Extension of the lung over the anterior surface of the heart.	Hypertrophy. Thickness of valves with flaccidity. Pericarditis with effusion.
	Increased.	Nervous affections. Chlorosis.	Dilatation with or without hypertrophy. Attenuation of the valves.

OF THE NORMAL SOUNDS.

NAMES.	CHARACTERS.	CAUSES.
First sound, or Systolic.	Dull and prolonged Isochronous with the pulse and systole of the ventricles.	Contraction of the muscular fibres of the ventricles.—*Laennec.* Concussion of the blood against the walls of the ventricles.—*Pigeaux.* Percussion of the thoracic parietes by the point of the heart.—*Magendie.* Extension of the mitral and tricuspid valves.—*Rouanet.* Extension of mitral and tricuspid valves, muscular contraction and muscular extension.—*Hope.*
Second sound, or diastolic.	Clear and short. Coincides with the diastole of the ventricles.	Contraction of the muscular fibres of the auricles.—*Laennec.* Concussion of blood against the base of the pulmonary artery and aorta.—*Pigeaux.* Percussion of the thoracic parietes by the anterior face of the heart.—*Magendie.* Extension of the sigmoid valves.—*Rouanet. Hope.*
Silence.		Coincides with the repose of the ventricles.

OF THE ABNORMAL SOUNDS.

NAMES.	CAUSES.	CONDITIONS IN WHICH THEY OCCUR.
Bellows-sounds	*Increase of friction* in the passage of blood through the orifices and cavities of the heart, from Reflux of blood in consequence of insufficiency of the valves. Obstructions to free circulation, from inequalities on their surfaces, or in the cavities themselves, or contraction of the aortic orifice. Energetic action of the heart. Variations in the quantity and quality of the blood. † Friction of inner surfaces of pericardium upon each other.	*Insufficiency of the valves, from* 1st. Inequality of their surfaces, 2d. Their adhesion to adjacent surfaces, and 3d. Dilatation of the auriculo-ventricular orifices. *Obstructions*, from 1st. Osseous, or cartilaginous formations on the valves, or 2d. Coagula in the orifices or cavities, 3d. Contraction of the aortic orifice. *Hypertrophy*, with dilatation. *Anemia, Chlorosis, and Nervous affections. Pericarditis.*
Rustling sound, sometimes resembling the bellows sound.	Dryness or glayeness of the pericardium immediately preceding the formation of false membrane.	Commencing pericarditis.
New leather sound.	Stretching of dense and resistant false membranes during the action of the heart.	Pericarditis with false membrane.
Superficial grating sound.	Calcareous concretions in the pericardium.	Pericarditis.

Metallic clanking. Percussion of the parietes of the chest by the point of the heart. Imitated by covering the ear with one hand and striking the back of it with the fingers of the other.

* The *Sure, Rasp, File*, and *Musical Sounds* are modifications of the bellows sounds indicating a higher degree of constriction of the orifices of the heart, and unevenness of surface of their valves. Pericarditis.

† The sounds accompanying pericarditis are more superficial and circumscribed than those which denote disease of the valves. These sounds when persistent, are stronger indications of organic disease, than when intermittent.

AUSCULTATION OF THE ARTERIES.

Intermittent bellows sound, and its modifications.	Obstructions to free circulation from 1st. Diminution of the calibre of the arteries, 2d. Inequalities of their inner surfaces, 3d. Aneurism, 4th. Variations in the quantity and quality of the blood.	Compression from external cause. Osseous or cartilaginous depositions. Aneurism. Varicose Aneurism. Chlorosis. Anemia.
Continuous bellows sound. Bruit de diable, or buzzing sound. **Sibilous.**		

Having examined Table of Thoracic Percussion and Auscultation by Dr. C. L. Mitchell, and finding it a correct compilation from the highest authorities, I take pleasure in recommending it as an exceedingly useful and convenient *vade mecum*.

New York, Oct. 11th, 1839.

WM. M. SWETT, M. D.,
Professor of the Theory and Practice of Physic and Clinical Medicine, in the New York College of Physicians and Surgeons.

The "Synoptical Table" of Dr. C. L. Mitchell, appears to me to be an accurate summary of our existing knowledge, in relation to the subject of Auscultation, and as such, I recommend it to the study of that department of medical science.

New York, 14 Le Roy Place, Oct. 18, 1839.

JOHN B. BECK, M. D.,
Professor of Materia Medica and Medical Jurisprudence, in the College of Physicians and Surgeons of New York.

Dear Sir:—I am satisfied that the table you are preparing for publication will be found extremely useful by the student of Auscultation. A careful examination of it has convinced me that it contains an accurate summary of our actual knowledge of the subject. Its arrangement is excellent.

Yours Truly,

New York, Oct. 11th, 1839.

J. A. SWETT, M. D.,
Lecturer on the Diseases of the Chest.